

# Falls Lake Challenges

## Falls Lake is a valuable, regional resource

- Supplies drinking water for 550,000 customers
- Provides a regional recreational facility
- Provides habitat to aquatic and terrestrial wildlife
- Protects water quality downstream

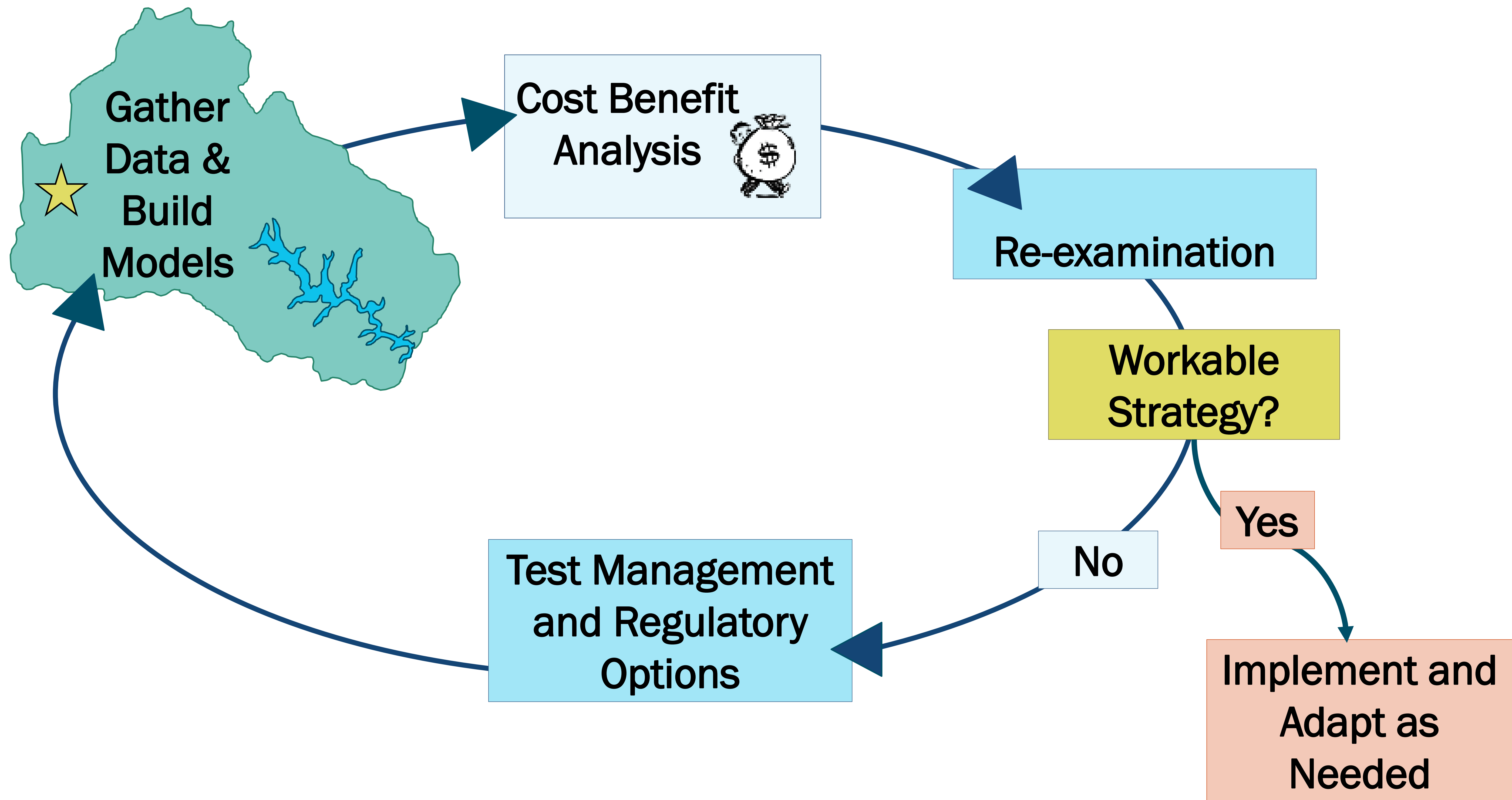
## Exceedances of chlorophyll-a thresholds resulted in

- The lake being listed as impaired under the Clean Water Act
- The State developing the Falls Lake Nutrient Management Strategy

## The Falls Lake Nutrient Management Strategy

- Two stages: Stage I and Stage II
- Highest nutrient reduction requirements ever passed in North Carolina
- Uncertain that goals are achievable
- Limits collaboration among regulated entities
- Very expensive (estimated to cost over \$1.5 billion)
- **Allows for the reexamination of Stage II**

# Framework for the UNRBA Re-examination

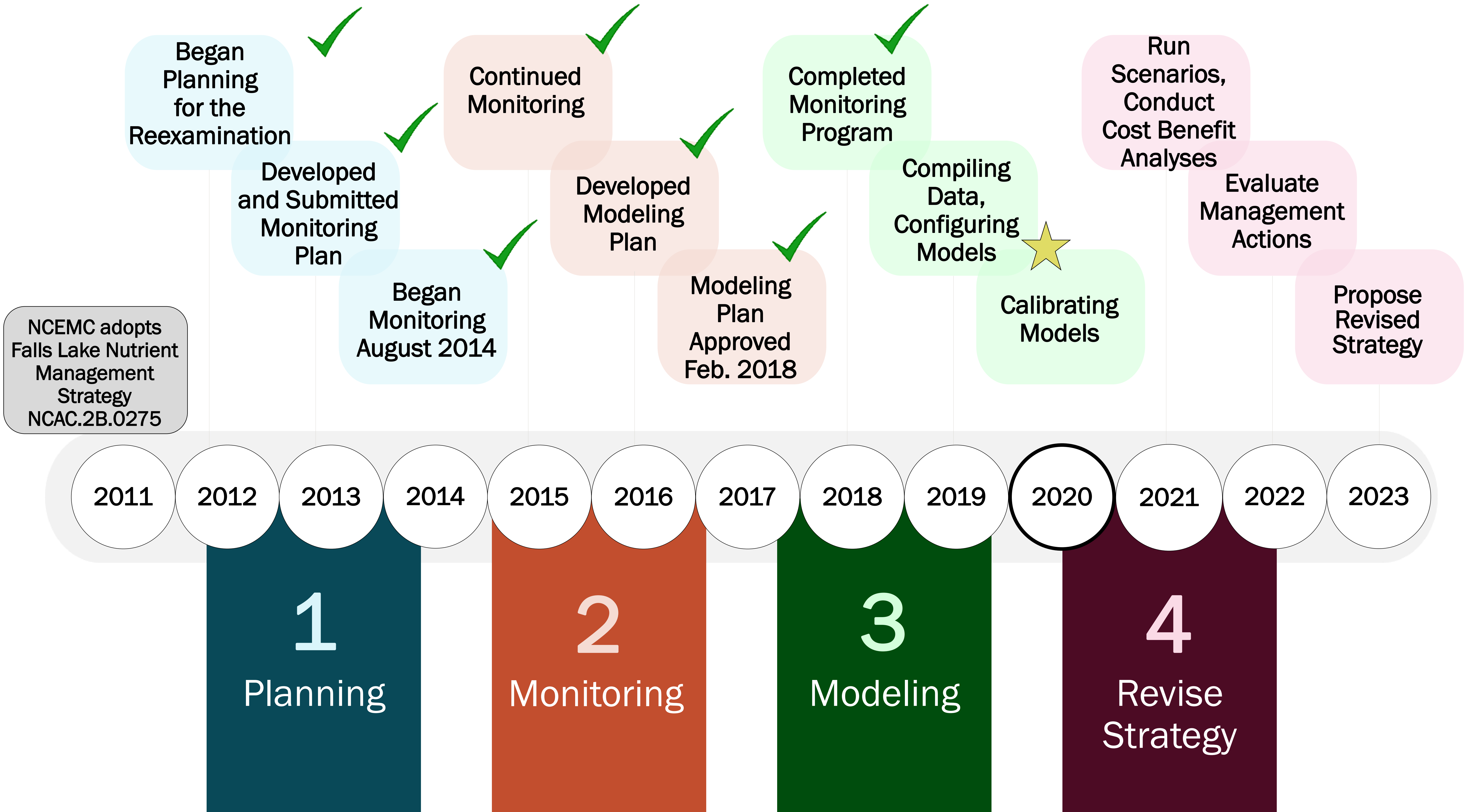


★ We are here.

# Multi-year UNRBA Re-examination Timeline

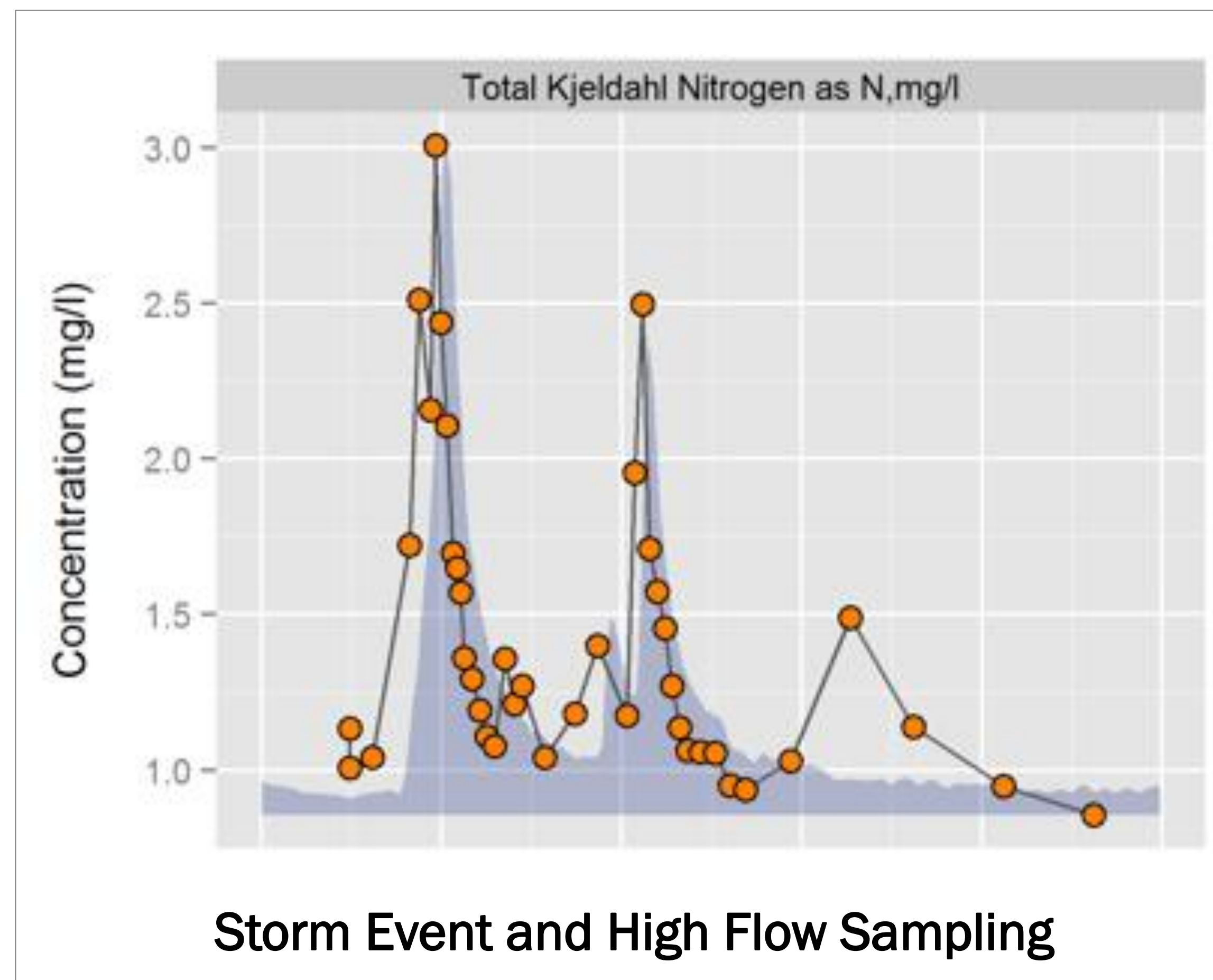
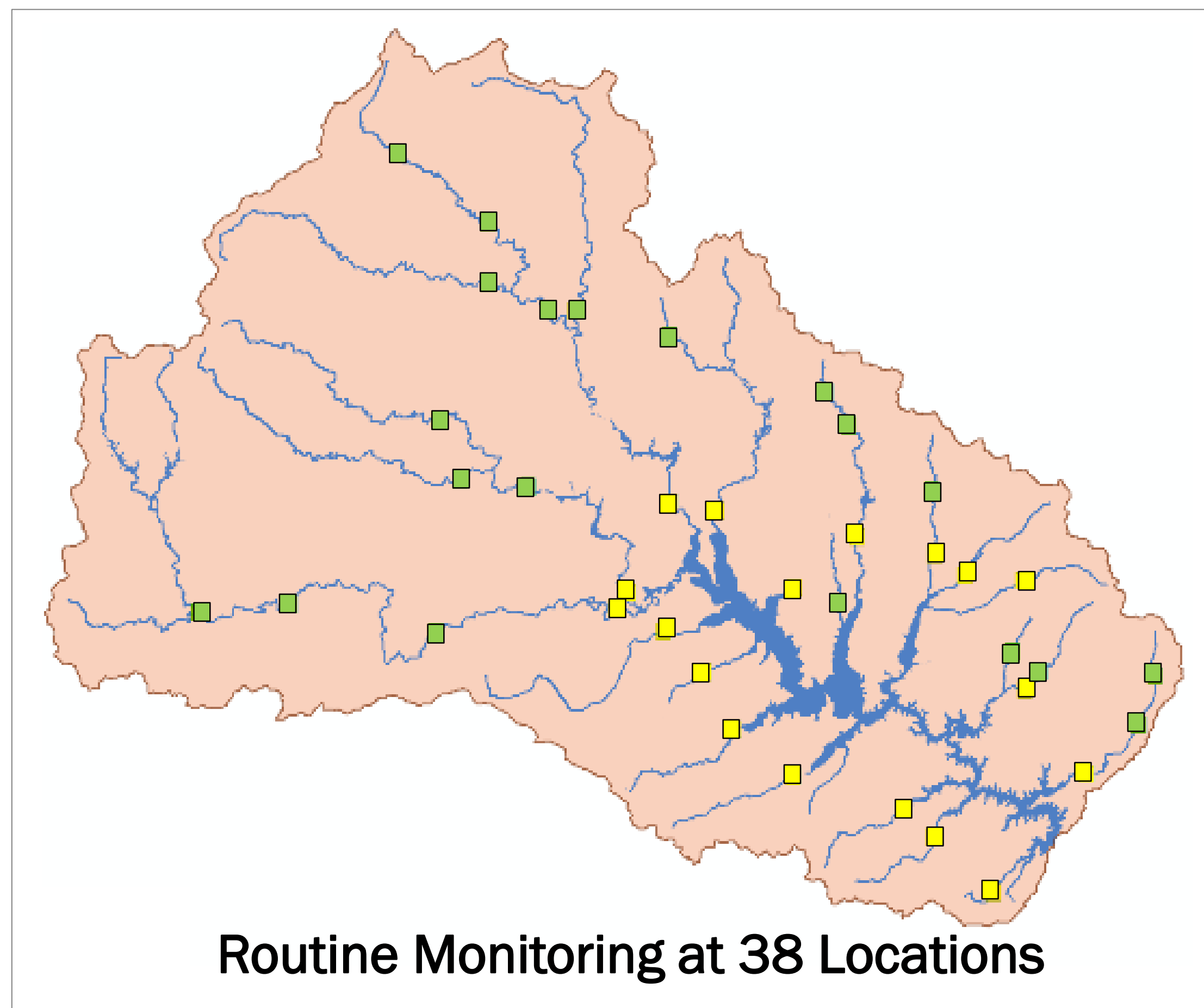
★ We are here.

Coordinate with the UNC Collaboratory



# Water Quality Monitoring to Support Modeling

- UNRBA data collection began in August 2014
  - 38 watershed stations monitored for nutrients, chlorophyll-a, and carbon
  - 12 stations in Falls Lake monitored for supplemental water quality data
  - 6 special studies



# Public Access to UNRBA Data and Reports

## Data Portal:

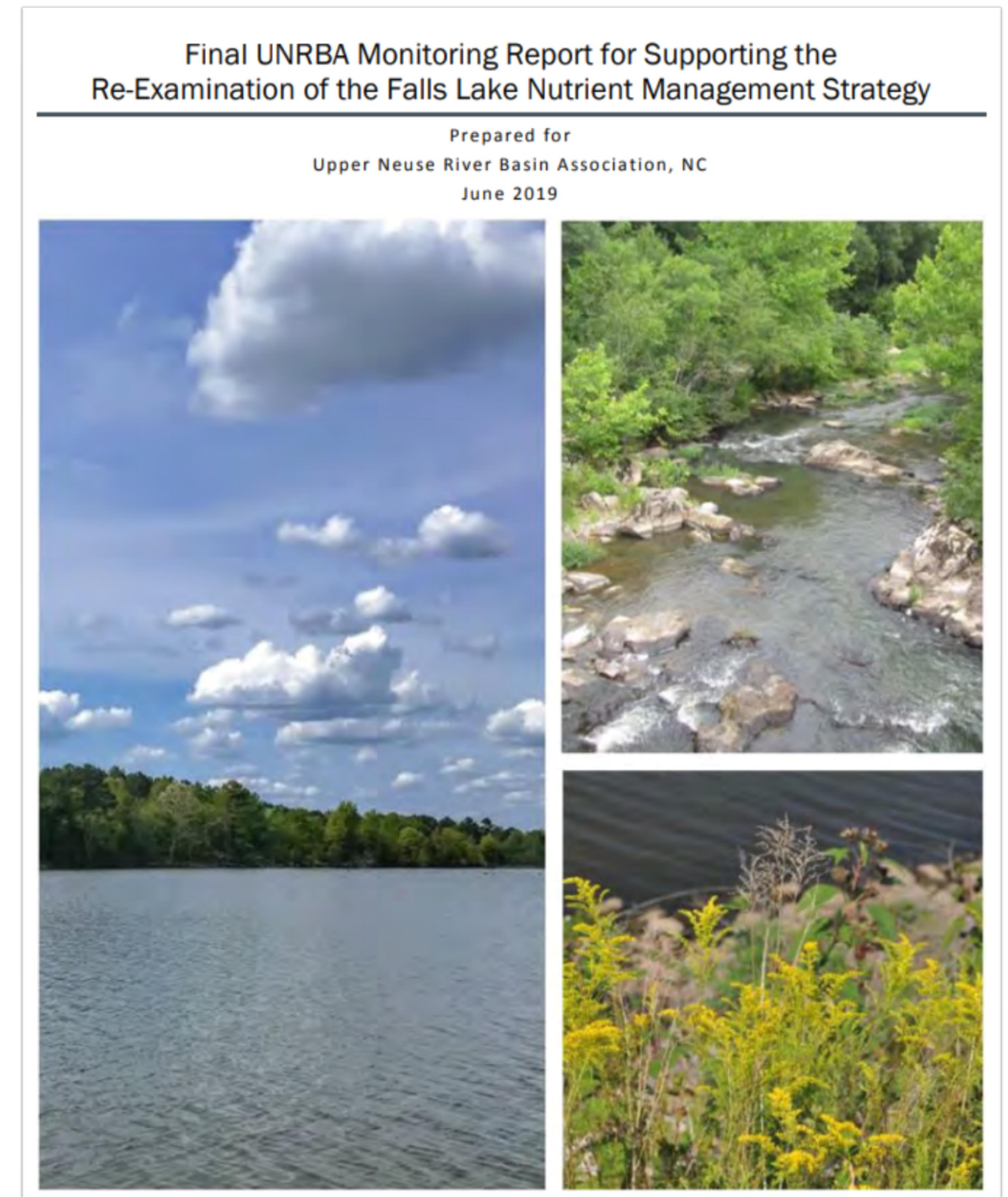
[Monitor.unrba.org](https://monitor.unrba.org)

- Create an account
- See User's Guide (monitoring page)
- Query and download data
- Generate statistics and figures

## Comprehensive Monitoring Report:

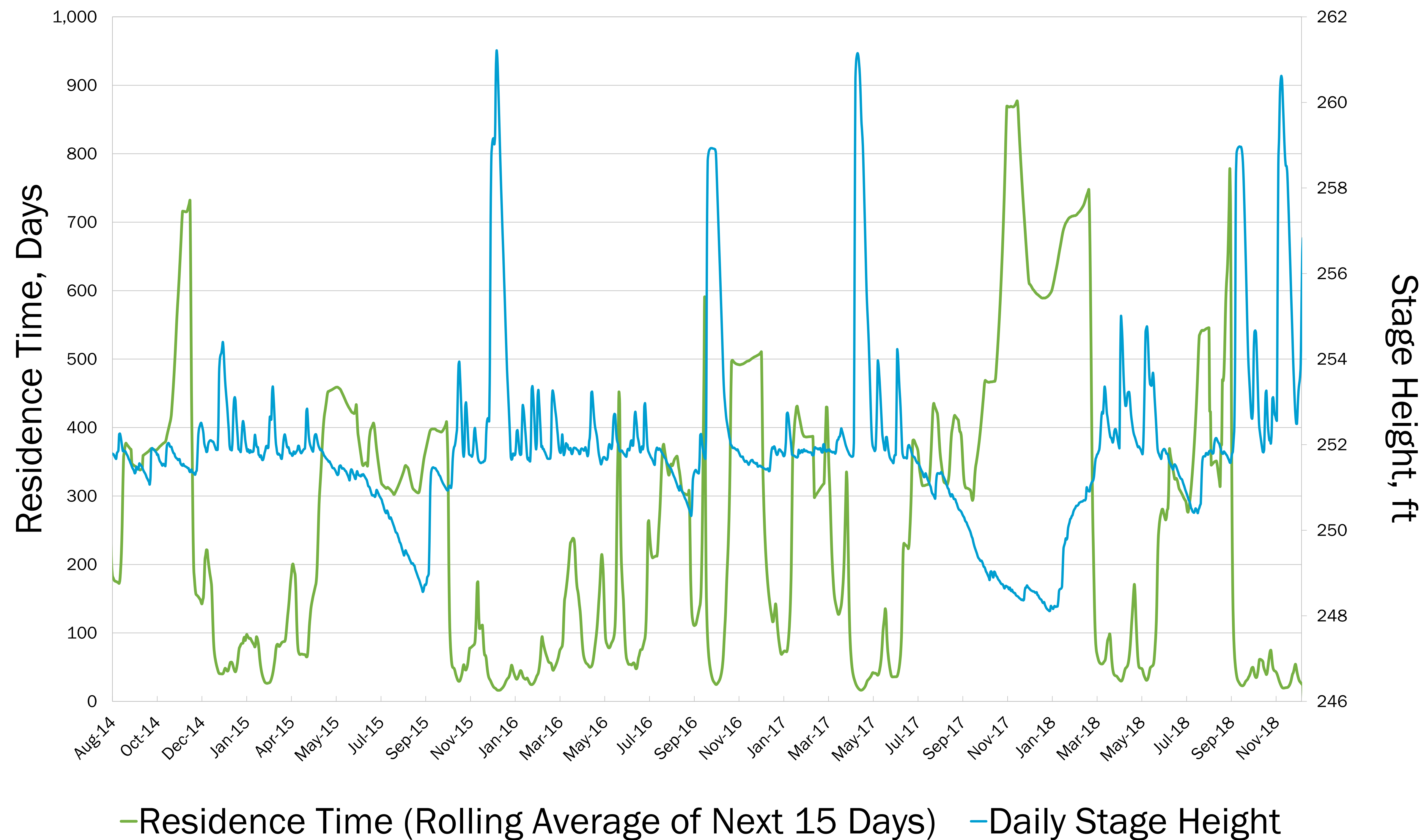
[UpperNeuse.org/resource-library](https://UpperNeuse.org/resource-library)

Final Monitoring Report for the Falls Lake Nutrient Management Strategy Reexamination



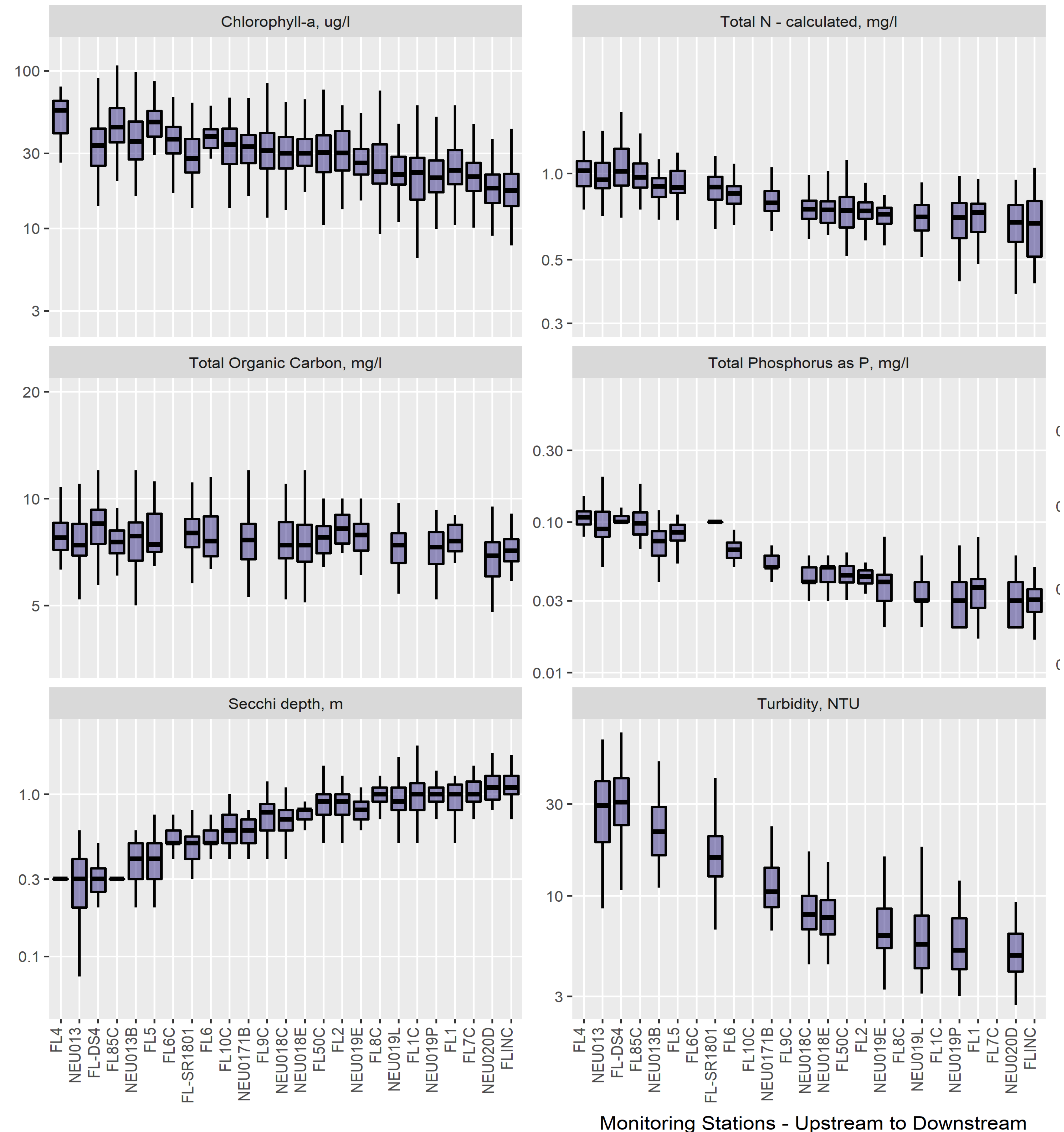
# Reservoir Residence Time

- How long does water spend in Falls Lake?
  - Changes rapidly due to inflows and management of outflows at the dam
  - Ranges from a couple of days to almost 900 days
  - Impacts the growth of algae due to stagnation and flushing



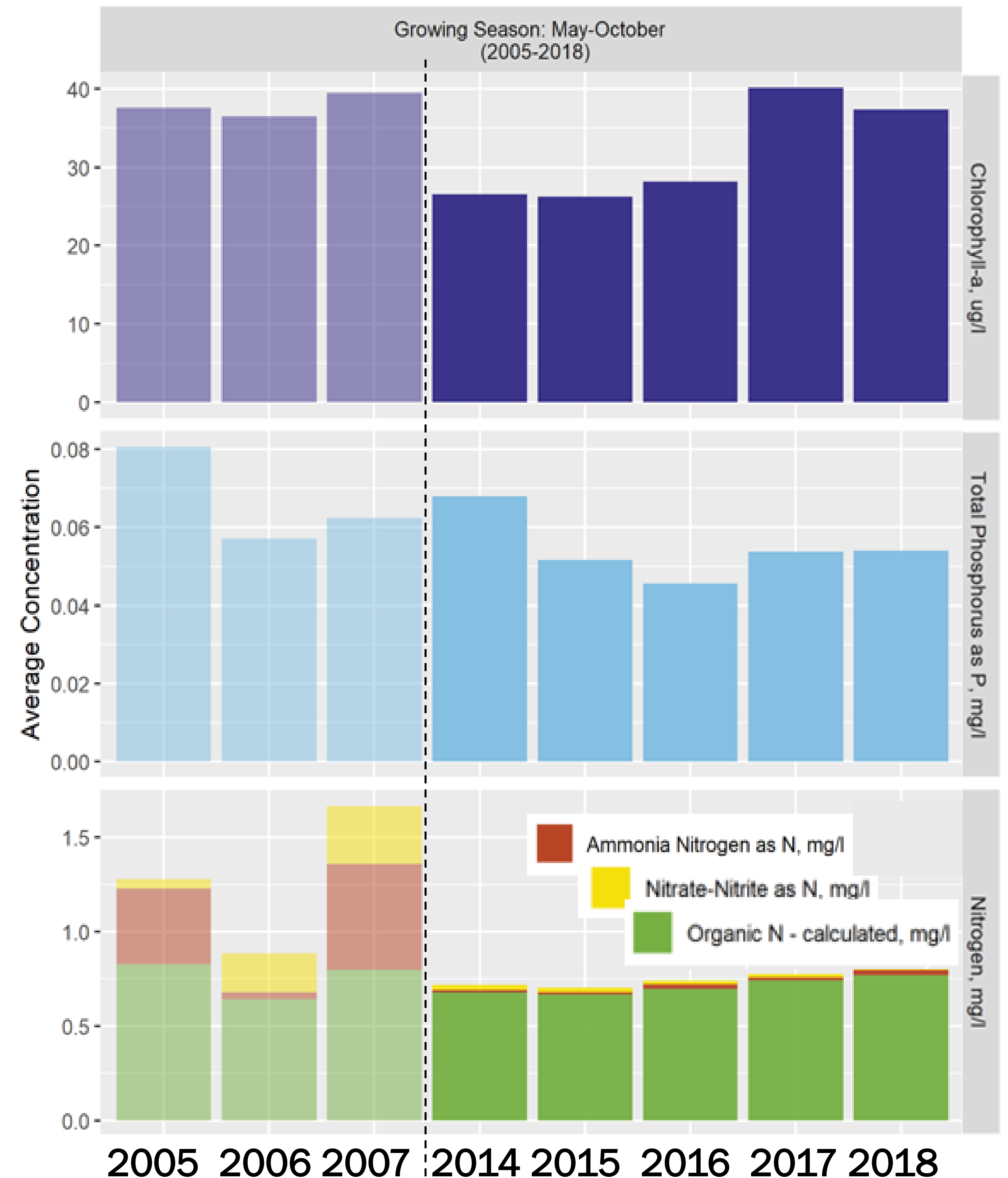
# Water Quality Trends in the Lake

- Water quality improves from the upstream end to the downstream end
- Improves toward the City of Raleigh's water supply intake
- Chlorophyll-a (indicator of algae) decreases
- Total nitrogen and phosphorus decrease
- Turbidity decreases
- Water clarity increases (see Secchi depth)
- Total organic carbon stays about the same



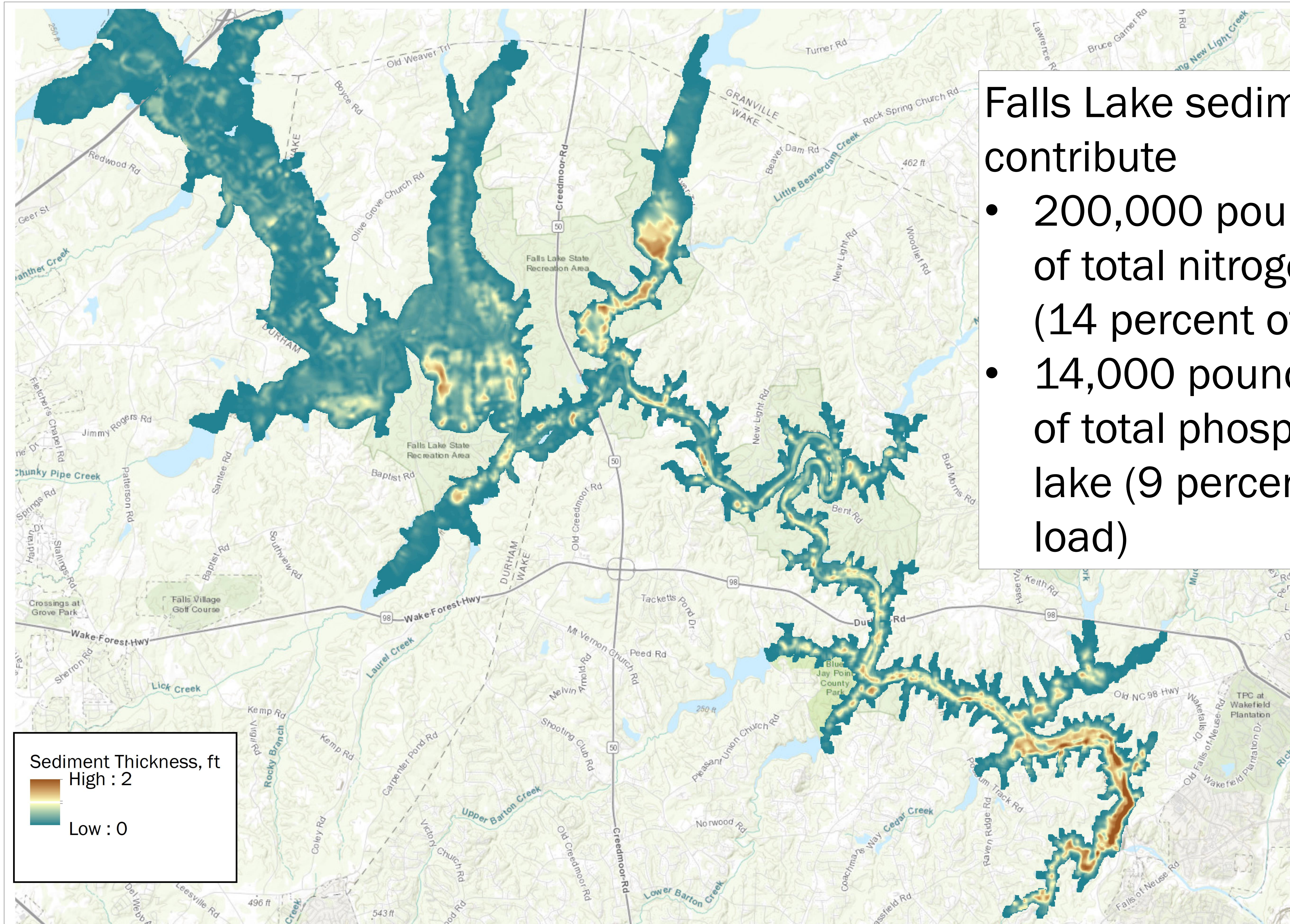
# Water Quality Trends in Falls Lake Since the Baseline Period

- Chlorophyll-a concentrations (top panel)
  - Similar to or lower than the baseline period
  - 2017 was the highest for the recent monitoring period, but it had the lowest nutrient loading
- Total phosphorus concentrations (middle panel)
  - Similar to or lower than baseline period
- Total nitrogen concentrations (lower panel)
  - Consistently lower than baseline





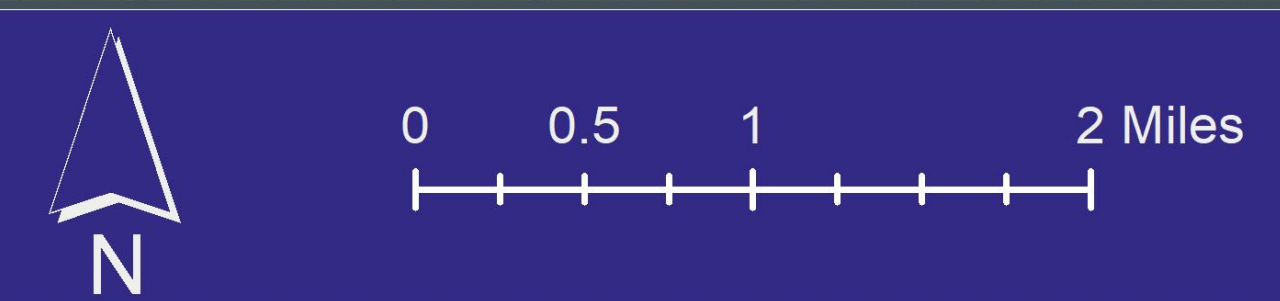
# Nutrient Releases from Lake Sediments



Falls Lake sediments contribute

- 200,000 pounds per year of total nitrogen to the lake (14 percent of the total load)
- 14,000 pounds per year of total phosphorus to the lake (9 percent of the total load)

Sediment Thickness, ft  
High : 2  
Low : 0



Falls Lake Sediment Thickness  
Upper Neuse River Basin Association  
North Carolina

